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The CUPID-Mo double-beta decay bolometric experiment and performance

CUPID-Mo is an experiment to search for neutrinoless double beta ($0\nu2b$) decay of ^{100}Mo , ongoing in the Modane underground laboratory (France) since March 2019. The detector array consists of twenty 0.2-kg ^{100}Mo -enriched lithium molybdate scintillating bolometers (containing 2.26 kg of ^{100}Mo) operated at ~ 20 mK. CUPID-Mo confirms on larger scale a reproducibility of high energy resolution (~ 5 -6 keV FWHM at 2615 keV) and highly efficient alpha background rejection (well beyond required 99.9%) of lithium molybdate cryogenic detectors. Moreover, a large exposure acquired (~ 2 kg*yr) allows to demonstrate the U/Th activity in the crystals on the level of 1 uBq/kg (^{226}Ra) or below (^{232}Th). These results are of a great importance not only for the CUPID-Mo sensitivity to ^{100}Mo $0\nu2b$ decay, but also for the implementation of a large-scale experiment CUPID, following closely the CUPID-Mo detector configuration.

Mini-abstract

CUPID-Mo shows high performance and radiopurity of ^{100}Mo -enriched Li_2MoO_4 scintillating bolometers

Experiment/Collaboration

The CUPID-Mo Collaboration

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